

Claims

1. A surgical instrument, comprising:
 - a handle portion operably configured to produce an articulation motion and a firing motion;
 - a shaft having a longitudinal axis attached to the handle portion for transferring the
 - 5 articulation motion and the firing motion;
 - an end effector;
 - an articulation mechanism coupling the shaft to the end effector and responsive to the articulation motion to rotate the end effector from the longitudinal axis of the shaft;
 - 10 and
 - a firing mechanism responsive to the firing motion and coupled for movement through the articulation mechanism and end effector, the firing mechanism comprising:
 - an actuating portion having a first thickness and positioned in the end effector, and
 - 15 an articulation portion proximally attached to the actuating portion and having a second thickness less than the first thickness for articulating movement through the articulation mechanism.
2. The surgical instrument of claim 1, wherein the end effector comprises a pair of pivotally opposing jaws for clamping tissue, the actuating portion of the firing mechanism includes a distally presented cutting edge for severing the clamped tissue.
3. The surgical instrument of claim 2, the end effector further comprising:
 - an elongate channel coupled to the handle portion and including a channel slot;
 - a staple cartridge received by the elongate channel and incorporating a proximally positioned wedge member aligned to cam upward a driver supporting a staple;
 - 5 an anvil pivotally coupled to the elongate channel and including an anvil channel; and
 - the articulation portion of the firing mechanism including the distally presented cutting edge longitudinally received between the elongate channel and the anvil,
 - an upper member engageable to the anvil channel, a lower member engaging the

channel slot, and a middle member operable to actuate the staple cartridge by
10 distally translating the wedge member of the staple cartridge.

4. The surgical instrument of claim 3, wherein the shaft further comprises an articulation drive tube responsive to the rotational motion from the handle portion and distally terminating in a gear section, the articulation mechanism comprising a spur gear proximally attached to the end effector and engaged by the gear section.

5. The surgical instrument of claim 1, wherein the shaft further comprises an articulation drive tube responsive to the rotational motion from the handle portion and distally terminating in a gear section, the articulation mechanism comprising a spur gear proximally attached to the end effector and engaged by the gear section.

6. A surgical instrument comprising:
a handle portion operable to produce a firing motion, a closing motion, and an articulation motion;
a shaft coupled to the handle portion operable to separately transfer the firing motion,
5 the closing motion, and the articulation motion;
an elongate channel coupled to the shaft and including a channel slot,
an anvil pivotally coupled to the elongate channel, responsive to the closing motion from the shaft, and including an anvil channel; and
a firing device including a distally presented cutting edge longitudinally received
10 between the elongate channel and the anvil; and
an articulation mechanism pivoting the elongate channel from the shaft in response to the articulation motion;
wherein firing device includes a thinned strip portion transitioning through the articulation mechanism.
7. The surgical instrument of claim 6, wherein the firing device configured to affirmatively space the anvil from the elongate channel during longitudinal travel between the anvil and elongate channel.
8. The surgical instrument of claim 6, further comprising a staple cartridge engaged by the elongate channel and including a proximally opened slot for receiving the cutting edge of the firing device, the staple cartridge including a plurality of staples cammed upwardly by the distal longitudinal movement of the firing device.
9. The surgical instrument of claim 8, wherein the staple cartridge further includes a plurality of drivers supporting the plurality of staples and a wedge sled responsive to the distal longitudinal movement of the firing mechanism to cam upwardly the drivers and thus form the plurality of staples against the anvil.
10. The surgical instrument of claim 8, wherein the anvil forms an inwardly biased relation to the elongate channel configured to assist the firing device in affirmatively spacing between the anvil and elongate channel during actuation of the staple cartridge.

11. A surgical instrument, comprising:
a handle portion operably configured to produce a rotational articulation motion and a longitudinal firing motion;
a shaft operably configured to separately transfer the rotational articulation motion
5 and the longitudinal firing motion;
an end effector distally coupled to the shaft means;
an articulation mechanism responsive to the rotational articulation motion to articulate the end effector; and
a firing bar responsive to the longitudinal firing motion of the handle portion, the
10 firing bar comprising:
an elongate strip longitudinally positioned for movement through the articulation mechanism, and
a firing bar head distally connected to the elongate strip and positioned for longitudinal movement in the end effector.
12. The surgical instrument of claim 11, wherein the handle portion comprises a handle means for producing a rotational articulation motion and a longitudinal firing motion, and the shaft comprises a shaft means for separately transferring the rotational articulation motion and the longitudinal firing motion.
13. The surgical instrument of claim 12, wherein the handle means further comprises a means for producing a longitudinal closing motion, and the shaft means further comprises a means for separately transferring the longitudinal closing motion.